ABSTRACT

The present invention provides vectors and methods which improve the efficiency of nucleic acid insertion into circular vectors, which generally facilitate nucleic acid cloning and specifically facilitate the preparation of DNA libraries. In general, the present invention involves separation of the cloning process into two distinct steps: (a) insertion which is done at a high nucleic acid concentration favoring intermolecular joining, and (b) circularization which is performed at a low nucleic acid concentration favoring intramolecular circularization. The present vectors generally have distinct insertion ends and circularization ends which are blocked from covalent joining during the insertion step. Circularization ends contemplated by the present invention include complementary cohesive ends and topoisomerase-linked ends. The present vectors and methods allow minute amounts of nucleic acid inserts to be efficiently cloned. Moreover, little or no insert size selection occurs with the present methods so that large as well as small nucleic acid inserts are readily inserted into the present vectors. Thus, DNA libraries which are representative of the entire range of size of DNA inserts can be made, and, for example, full length cDNA libraries are readily obtained.

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